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EPA Superfund
Record of Decision:

WOODSTOCK MUNICIPAL LANDFILL
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WOODSTOCK, IL
06/30/1993

RECORD OF DECISION

SELECTED REMEDIAL ALTERNATIVE

DECLARATION

SITE NAME AND LOCATION

Woodstock Municipal Landfill
Woodstock, Illinois

STATEMENT OF BASIS AND PURPOSE

This decision document represents the United States Environmental Protection Agency's (U.S. EPA) selected remedial action for the Woodstock Municipal Landfill (Woodstock) site located in Woodstock, Illinois. This decision document was developed in accordance with the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and to the extent practicable, with the National Oil and Hazardous Substances Contingency Plan (NCP). This decision is based on the Administrative Record for this site.

The State of Illinois is expected to concur with the selected remedy.

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from the site, if not addressed by implementing the response action selected in this Record of Decision (ROD), may present an imminent and substantial endangerment to public health, welfare, or the environment.

DESCRIPTION OF THE REMEDY

This remedy is intended to be the final action for the site. The remedy addresses all contaminated media and includes: contaminated soil, sediment, and groundwater, landfilled wastes, leachate generation and emission of landfill gases.

The major components of the selected remedy include:

- Excavation and consolidation of contaminated sediments and sludges under the landfill cap;
- Installation and maintenance of a geosynthetic landfill cap in compliance with Illinois Administrative Code (IAC) Title 35, Subtitle G, Chapter 1, Subchapter i: Solid Waste and Special Waste Hauling, Part 811.314;
- Installation and maintenance of a landfill gas venting system that is compatible with the type of cap specified in this Record of Decision;
- Installation and operation of a groundwater extraction, treatment, and discharge system;
- Development and implementation of a comprehensive monitoring program to ensure the effectiveness of the remedy;
- Mitigation of wetland areas where contaminated sediment removal occurs;
- Mitigation of wetland damage or loss during or after remedial activities are complete;
- Development and implementation of a surface water and sedimentation control system;
- Implementation of institutional controls to limit land and groundwater use.

STATUTORY DETERMINATIONS

The selected remedy is protective of human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost-effective. This remedy utilizes permanent solutions and alternative treatment technologies to the

maximum extent practicable and satisfied the statutory preference for remedies which employ treatment that reduces toxicity, mobility, or volume as a principal element.

Because this remedy may result in hazardous substances remaining on-site above health-based levels, a review will be conducted at least every five years after commencement of the remedial action to ensure that the remedy continues to provide adequate protection of human health and the environment.

SUMMARY OF REMEDIAL ALTERNATIVE SELECTION
WOODSTOCK MUNICIPAL LANDFILL
WOODSTOCK, ILLINOIS

I. Site Name, Location and Description

The Woodstock Municipal Landfill site is located on the south side of the city of Woodstock, Illinois, a municipality with a population of approximately 14,350 residents. The site is located south of Davis Road, southwest of the intersection of U.S. Route 14 and Illinois Route 47 and is shown on Figure 1. The coordinates for the site are northeast quarter of Section 17, Township 44 North, Range 7 East (NE 1/4, Se 17, T44N, R7E).

The land surrounding the Woodstock site is a mixture ofresidential, agricultural, wetlands, commercial, and light industrial use. Land use immediately north of the site is primarily residential and agricultural. Land use west of the site is semiagricultural with much of the land currently classified as a wetland. Wetlands are located adjacent to the site on the east. Kishwaukee River runs south along the southwestern perimeter of the site. The City of Woodstock Wastewater Treatment Plant and additional wetlands are also located south of the site.

The site geology consists of a complex sequence of unconsolidated glacial deposits which are approximately 200 feet thick. These deposits have been divided into four units; an upper sand and gravel aquifer, an intermediate clay till member, a lower clay till member, and a sand unit which overlies bedrock comprised of dolomite and shale. The glacial and bedrock aquifers underlying the site are considered to be Class I by the State of Illinois. Class I aquifers include groundwater which is either currently being used or has the potential to be used as a drinking water source. Surface water runoff is generally to the west and south and is confined by drainage to the wetlands and subsequent infiltration or overland flow into Kishwaukee River.

The nearest residents to the site are located approximately 500 feet north of the site. The nearest existing residential well which may potentially be impacted by the contaminated groundwater if further migration occurs is located approximately 2500 feet southwest of the site. Based on data collected during the remedial investigation, groundwater contamination has not migrated to the local residential wells used for drinking water. The majority of the residents in the City of Woodstock are provided water through a municipal water supply system. This system is not considered to be threatened by the site.

II. Site History and Enforcement Activities

The landfill had a number of different owners between 1935, when it was first used as a trash dump and open burning area, and when it was covered and classified as closed by the IEPA in October 1980. The current owner of the landfill property is the City of Woodstock. Other properties which are considered part of the site are under private ownership. From approximately 1940 until leased to Woodstock in 1958, the site was used as a local trash dump and open burning area by William Gaulke. The site was used by the City under a lease agreement with Mr. Gaulke as a household garbage and municipal landfill from 1958 until its acquisition by the City in 1968. Following acquisition of the property, the property was used for the disposal of household and municipal solid waste and various industrial solid wastes including waste paint and coating materials, plating wastes, solvents, waste metals, inks and drummed material including polychlorinated biphenyls. In addition, approximately 7200 cubic yards of sludge generated by Woodstock Die Casting Inc., an Allied Signal subsidiary was also disposed of at the landfill.

The IEPA filed a complaint against the City of Woodstock in 1972 regarding operation of the landfill. The Illinois Pollution Control Board (IPCB) issued an opinion that evidence substantiated charges of open dumping, liquid deposition without approval, failure to follow set guidelines, and operating without a permit. The City of Woodstock was ordered to cease and desist all violations, obtain the necessary permits, and was fined for its actions. During this same time period, IEPA requested the installation of a leachate collection system to address releases from the landfill. However, no system was installed and a waiver was granted by the IPCB based on the City of Woodstock's stated intent to close the landfill in the near future and because the leachate did not violate surface water standards at the time. The City discontinueddisposal

activities at the site in 1975 and closed the landfill by covering it with fill material. Numerous inspections were conducted at the site by IEPA from 1975-1980. IEPA continually notified the city during this time that the landfill was indeed no longer accepting waste and was considered closed, but the final cover was deficient. In 1980, the IEPA classified the site as closed and covered. In 1983, the City was granted a permit from the IEPA to landfarm municipal sewage sludge at the site. A second permit was issued by the IEPA in July 1988, but sludge application was discontinued prior to that date, so the later permit has not been used.

During a July 1988 sampling investigation by the Technical Assistance Team (a USEPA contractor tasked to do site investigations), residential wells located downgradient of the landfill were sampled and found to contain arsenic, selenium, and thallium in excess of the Safe Drinking Water Act maximum drinking water levels. A subsequent sampling investigation in December 1988 again detected these substances in the same wells, but the concentrations did not exceed the regulatory criteria.

Based on the results of U.S. EPA and IEPA investigations and taking into account such factors as populations at risk, the potential of hazardous substances being present, the potential for contamination of drinking water supplies and the potential destruction of sensitive ecosystems, the site was proposed to be placed on the National Priorities List in June 1988. The site was placed on the National Priorities List in October 1989. A consent order to conduct an RI/FS was agreed to by Allied Signal and the City of Woodstock in September 1989.

III. Highlights of Community Participation

Compliance with the public participation requirements of Section 113 (k)(2)(B)(i-v) of CERCLA/SARA, have been achieved for the Woodstock site by:

- A press release was issued in June 1990 announcing a public "Remedial Investigation/Feasibility Study (RI/FS) kick-off" meeting to be held to inform the community as to U.S. EPA plans;

- The public "RI/FS kick-off" meeting was held in June 1990, announcing the initiation of the RI/FS;

- A fact sheet was developed and distributed in conjunction with the June 1990 meeting;

- A site information repository was established at the Woodstock Public Library to allow local access to site-related documents;

- A fact sheet was sent to all persons or organizations on the community relations mailing list in October 1992 updating them on the progress of the project;

- An Administrative Record has been compiled, including the RI, Baseline Risk Assessment, FS, and other documents, and has been placed in the site information repository;

- A formal advertisement announcing the commencement of the public comment period, the availability of the proposed plan, and the time and place of the public meeting was placed in the Northwest Herald on April 7, 1993. The Herald is a major local paper of general circulation;

- The Proposed Plan for remedial action was released for public comment and placed into the Administrative Record on April 9, 1993;

- A thirty (30) day comment period was established and scheduled to end on May 10, 1993;

- A public meeting was held on April 28, 1993, at the Woodstock Public Library at which U.S. EPA and IEPA presented the Proposed Plan to the community and received verbal comments. A transcript was kept of the public meeting and was made available to the public and placed in the Administrative Record and site repositories;

- A fact sheet was developed and distributed in conjunction with the April 28, 1993 meeting;

- U.S. EPA granted a thirty (30) day extension of the public comment period on April 28, 1993, extending the closing date to June 9, 1993;

- An advertisement was placed in the local newspaper on May 12 and May 13, 1993, announcing the extension of the public comment period to June 9, 1993;

- Three public availability meetings were held on June 2, 1993 at the Woodstock Public Library to address community concerns dealing with the risks posed by the site as well as to answer additional concerns with the proposed remedy:

- U.S. EPA has received oral and written comments regarding the RI/FS, Baseline Risk Assessment, and the Proposed Plan. Comments have been addressed in the attached Responsiveness Summary.

IV. Scope and Role of the Selected Remedy

This ROD addresses remediation of the contaminated surface soil, sediments, and groundwater and addresses leachate which is being generated and is discharging from the landfill. The contaminants found in these media represent the principal threat from the Woodstock site. The generation of leachate presents a threat as a continuous contaminant source to groundwater, surface water and to the wetland surrounding the site. In addition, a direct contact threat exists from exposure to surface soils and leachate. The primary purpose of this remedy is twofold; 1) to restore the contaminated groundwater to an acceptable level that will allow for its unrestricted use and 2) to cap the landfill, thereby minimizing the generation of leachate and eliminating the risk posed by the surface soils and sediments.

V. Summary of Site Characteristics

The remedial investigation was conducted by the PRP's contractor, Warzyn, and was initiated in July 1990. The investigation was completed in June 1992 when the Final Remedial Investigation Report was issued. The remedial investigation identified the types of contaminants that are migrating from the landfill, and assessed the potential impact of contaminant migration on human health and the environment. The assessment of the landfill was accomplished by conducting three phases of field work. The purpose of phase I was to gather information on the general nature of the site, such as the geology and hydrogeology, and to identify and quantify the nature of any potential impact at or surrounding the site. The purpose of phase II was to complete the understanding of the site characteristics. This included delineation of the extent to which contamination was released from the site and the interactions between groundwater, surface water and leachate. The assessment was completed with the phase III investigation which included test pit excavation, waste sampling, additional soil sampling and further refinement of the groundwater flow regime of the site. Figures 2 and 3 depict the locations of the various samples which were collected during these phases of work. During the course of these phases of fieldwork, data were obtained from sampling residential wells, monitoring and leachate wells, surface and subsurface soils, surface water and sediment.

The following is a brief overview of the nature and extent of the contamination found during the investigation:

Landfill Gas Characteristics

Gas samples were collected from leachate wells with the highest rate of gas flow (LW-3 and LW-4). Volatile organic compounds (VOCs) were detected and included Freon 114, chloroethane, benzene, toluene, chlorobenzene, ethylbenzene, 4-ethyl toluene, 1, 3, 5-trimethylbenzene, 1,2,4-

trimethylbenzene, and xylene. Concentrations of these compounds ranged from 48 to 470 ppb.

Landfill Leachate Characteristics

Two rounds of leachate samples were collected from each of the five leachate wells. Analysis of these samples detected the presence of VOCs including benzene, chlorobenzene, 1,2 dichloroethene, toluene, and xylene ranging in concentration from 1 to 16 ppb. Naphthalene, a semi-volatile compound, was also detected at concentrations ranging from 6 to 34 ppb. In addition, several tentatively identified VOCs and semi-volatile organic compounds (SVOCs) were also identified and ranged in concentration from 3-48 ppb. A number of metals including arsenic, antimony, barium, beryllium, cadmium, cobalt, copper, chromium, iron, lead, magnesium, mercury, nickel, selenium, silver, vanadium, and zinc were also detected and ranged in concentration from 1 ppb to 185 ppm. Metals which were detected that exceeded primary drinking water standards include arsenic (ranged from 77-102 ppb with 50 ppb as the standard), barium (810-10, 800 ppb, standard is 1000 ppb), chromium (86-1400 ppb, standard is 50 ppb), copper (497-3070, standard is 1300 ppb), lead (150-18,000 ppb, standard is 15 ppb), mercury (2.2-3.9 ppb, standard is 2 ppb), and nickel (1070-15,000 ppb, standard is 100 ppb). During the installation of the leachate wells, it was noted that infiltration of water was causing a mounding effect to occur, generating a large volume of leachate that subsequently discharges from the landfill.

Surface Soil Characteristics

Surface soil samples were collected and were found to be contaminated with numerous SVOCs, many of which were tentatively identified but were classified as unknown. SVOCs which were identified include phenanthrene, di -n-butylphthalate,, fluoranthene, pyrene, butylbenzylphthalate, benzo(a)anthracene, chrysene, benzo(a)pyrene, benzo(g,h,i)perylene, benzo(b)fluoranthene, benzo(k)fluoranthene, and 4-chloroaniline. Concentrations of the known and tentatively identified SVOCs range from 43- 23000 ppb. In addition, numerous inorganic compounds were also detected including arsenic, barium, cadmium, chromium, copper, iron, lead, magnesium, manganese, mercury, nickel, selenium, silver, and zinc. Concentrations of these compounds range from 0.07-34000 ppm.

Waste Characteristics

Five test pits were excavated in areas identified as possible drum disposal locations. One test pit yielded an intact drum containing polychlorinated biphenols (PCBs), acetone, 4 methyl-2-pentanone, and toluene. In addition, several crushed drum lids and/or drum fragments were also discovered during this activity. Other test pits located crushed drums which no longer contained waste product(s).

Groundwater Characteristics

A total of 17 monitoring wells were installed at the site and each of these wells was sampled twice, with the exception of MW-11, which was installed and sampled at the end of the scheduled fieldwork. Inorganic contaminants were detected including cyanide, lead, zinc, nickel, iron, manganese, and magnesium. Concentrations of these contaminants ranged from 3-1750 ppb. VOCs were also detected including benzene, toluene, chlorobenzene, 1,2 dichloroethene, and vinyl chloride. Concentrations of VOCs ranged from 2-21 ppb. Vinyl chloride, which was detected in the upper aquifer in monitoring wells MW-4D and MW-8, exceeded the maximum contaminant level (MCL) of 2 ppb for this contaminant. The vinyl chloride plume is shown on Figure 4. In addition, secondary drinking water standards were exceeded for iron, manganese, chloride, and total dissolved solids.

Surface Water Characteristics

A total of four surface water samples were collected from locations near the landfill in Kishwaukee River. Analysis of these samples identified the presence of arsenic, barium, copper, iron, lead, manganese, nickel and zinc. Concentrations of these contaminants ranged from ??4-32,200 ppb. The levels of iron detected in these samples exceeded the ambient water quality criteria for this compound.

Sediment Characteristics

Sediment samples collected from the surrounding wetlands and Kishwaukee River contained one VOC, toluene, at concentrations ranging from 7-92 ppb. In addition, arsenic, barium, iron, lead, magnesium, manganese, mercury, vanadium, selenium, copper, nickel, zinc, and chromium were also detected ranging in concentration from 0.15-67000 ppm.

The data tables which identify the media that was sampled, the contaminant(s) identified in that media, and the respective concentrations have been attached as an appendix to this document.

The key conclusions which may be surmised from this data are as follows:

Groundwater contamination was detected in the upper aquifer immediately southwest and downgradient of the landfill. The contaminant of concern, vinyl chloride, was detected at concentrations that exceed the maximum contaminant level of 2 ppb (e.g. the maximum permissible level) for this compound.

Contamination was detected in leachate gas samples and in leachate groundwater samples collected from wells on the landfill. The contaminants included volatile organics such as benzene, ethylbenzene, toluene and xylene. In addition, inorganic contaminants such as arsenic, barium, chromium, lead and mercury were also detected in excess of regulatory criteria. Leachate is also identified as the source of contamination that is adverselyaffecting the groundwater, surface water and sediments at the site.

Contamination was detected in surface soils, surface water, and sediments at the site. These three media were contaminated with a wide range of VOCs, SVOCs, and inorganic compounds.

Leachate generation, if not controlled, will continue to cause further releases to the impacted media and surrounding wetlands and result in further adverse environmental impacts. While the wetlands are currently

limiting the full impact of the landfill releases to the environment through attenuation, the capacity and capability of the wetlands to function in such a manner is limited.

VI. Summary of Site Risks

Risks to Human Health

A major goal of the RI was to assess potential risks to public health and the environment if the Woodstock site is not remediated. The assessment of impacts to human health is called the Baseline Risk Assessment (BLRA). Using information about what contaminants are present at the site, as well as the concentrations, quantities, locations and ability of the contaminants to migrate, a BLRA was developed to determine what, if any, risks are posed by the site and if remedial action is warranted.

Separate calculations are made for those compounds that can cause cancer and for those that can have other health effects. For the compounds that can cause cancer (carcinogens), risks are estimated as the additional possibility of developing cancer due to exposure to the compounds. For the noncancer causing compounds (noncarcinogens), a risk number called the hazard index (HI) is calculated so that if the risk is less than or equal to 1, no adverse health effects would be expected. If the risk is greater than 1, adverse health effects are possible.

The BLRA indicates that the site as it now exists, may pose an unacceptable cancer risk (CR) of 5 x 10[-5] or CR = 5 x 10[-5]) to trespassers (children/adolescents playing on-site) through exposure to surface soils. This exposure may occur through ingestion or dermal contact with polyaromatic hydrocarbons (PAHs) which are present in the contaminated surface soil. An additional physical hazard is currently posed to children by the debris piles and miscellaneous debris located on the site.

The BLRA also identified unacceptable cancer and non-cancer risks posed by the site under future land-use scenarios. As mentioned above under the current land use conditions, exposure to PAHs in the surface soil poses an unacceptable level of cancer risk to trespassers. In addition, under the potential future use scenario of the site being used as a park or recycling center, consumption of leachate from an on-site well was estimated to pose a potential non-cancer (hazard index of 10 or HI = 10) and cancer (CR = 4 x 10[-4]) risk to these park users. The primary chemicals that posed a non-cancer risk due to leachate consumption were cadmium, cobalt, copper, lead, nickel and zinc. The primary chemicals that posed a cancer risk were arsenic and beryllium. Another potential health risk would also exist if a well was placed in or near the area contaminated with vinyl chloride. In this scenario, an unacceptable cancer risk (CR = 1 x 10[-3]) exists if groundwater contaminated with vinyl chloride was consumed over a long exposure period by the resident(s) drinking from a contaminated well. The final scenario which was evaluated in the BLRA was use of the landfill itself for residential structures. Under this scenario, an unacceptable cancer risk (CR = 5 x 10[-3]) and non-cancer risk (HI = 100) is posed by using the leachate as a groundwater source, inhalation of volatile organic compounds, surface soil exposure and consumption of home grown vegetables.

ENVIRONMENTAL RISKS

The purpose of the ecological assessment is to identify contaminants of potential ecological concern associated with

the site and their effects on plant or animal species of concern. The ecological features of the site are shown on Figure 5. The assessment conducted for the Woodstock site has determined that copper, mercury, and zinc concentrations in the surface soils at the site may adversely affect small terrestrial mammal populations. Exposure of aquatic species to iron which was detected in exceedance of regulatory criteria also poses a potential risk. No conclusions could be reached as to whether past ecological effects have occurred due to the presence of other inorganic contaminants in surface water and sediments at the site due to the lack of biota sampling or biological assays. Additional ecological assessments will be conducted by the Natural Resources Trustee/U.S. Fish and Wildlife Service at the site.

SUMMARY

Actual and threatened releases of hazardous substances are occurring from this site. The source of the risks originate from the contaminants within the emanating from the landfill through releases to groundwater, surface water, sediments, soils, and air. If not addressed, these releases may present an imminent and substantial endangerment to public health, welfare or the environment. Thus, it is necessary that corrective and mitigative action be taken to address the threats posed by the actual or threatened releases.

VII. Description of Alternatives

Based on the results of the RI, a list of alternatives was assembled to address the site remedial action objectives and ensure compliance with the requirements of the NCP. These alternatives are presented in the Feasibility Study prepared for the site. The following remedial alternatives were developedand are briefly described below.

ALTERNATIVE 1 NO ACTION

CERCLA requires that the "No Action" alternative be evaluated at every site to establish a baseline against which all other alternatives are compared. Under this alternative, no remedial actions would take place and the site would remain in its present condition.

Capital cost: 0
Annual maintenance and monitoring cost: $10,000
Estimated present net worth: $37,000
Estimated time to implement: None

Note: The $10,000 maintenance and monitoring cost is not an annual cost, but reflects the cost of reviewing site conditions on a five year basis.

ALTERNATIVE 2 ACCESS RESTRICTIONS, INSTITUTIONAL CONTROLS AND MONITORING

The purpose of Alternative 2 is to control access to the site, and to monitor the groundwater and existing landfill cover. The major elements of this alternative include:

- Institutional controls
- Fencing
- Monitoring

Institutional controls would include land use restriction and deed restrictions to preclude groundwater usage.

A chain-link fence would be installed and maintained around the perimeter of the site. The purpose of the fence would be to control access to the site, and thus, limit exposure to the surface soils on-site. Erosion control measures would be taken during fence construction to protect the adjacent wetlands.

The primary objectives of monitoring would be to monitor groundwater quality, wetlands water quality, and the condition of the existing landfillcover. Groundwater sampling and analysis would be conducted on a periodic basis. Visual inspections of the cover and monitoring for differential settlement would also be performed. The frequency of all sampling activities or inspections will be determined by the USEPA and IEPA (the "Agencies") during Remedial Design.

Capital cost: $124,000
Annual maintenance and monitoring cost: $25,000
Estimated present net worth: $614,000
Estimated time to implement: 1 month

ALTERNATIVE 3 - ACCESS RESTRICTIONS, INSTITUTIONAL CONTROLS, GROUNDWATER EXTRACTION SYSTEM, AND MONITORING

The purpose of Alternative 3 is to control access to the site, contain and treat the contaminated groundwater, and monitor the groundwater and existing landfill cover. The major elements of this alternative are:

- Institutional controls
- Fencing
- Monitoring
- Groundwater extraction, treatment, and discharge

Institutional controls would include land use restrictions and deed restrictions to preclude groundwater

usage.

A chain-link fence would be installed and maintained around the perimeter of the site. The purpose of the fence would be to control access to the site, and thus, limit exposure to the surface soils on-site. Erosion control measures would be taken during fence construction to protect the adjacent wetlands.

The objectives of monitoring would be to assess the following: treatment system efficiency, groundwater and wetland quality, and the condition of the existing landfill cover. Groundwater and treatment system sampling and analyses would be conducted on a periodic basis. The landfill cover would also be periodically inspected visually and monitored for differential settlement. The frequency of all sampling activities and inspections will be determined by the Agencies during Remedial Design.

The groundwater extraction system would consist of installing groundwater extraction wells in the area of vinyl chloride contamination. Groundwater would then be pumped from the extraction system to the publicly owned treatment works (POTW). On-site treatment will be required only if pretreatment standards are exceeded during this action.

Capital cost: $576,000
Annual maintenance and monitoring cost: $101,000
Estimated present net worth: $1,414,000
Estimated time to implement: 6 months

ALTERNATIVE 4 - INSTITUTIONAL CONTROLS, RECONSTRUCT EXISTING COVER, AND MONITORING

The purpose of Alternative 4 is to minimize infiltration, promote surface water runoff, eliminate leachate seeps, and isolate the contaminants of concern. The major elements of this alternative include:

- Institutional controls
- Monitoring
- Cover reconstruction

Institutional controls would include land use restrictions and deed restrictions to preclude groundwater usage.

Periodic monitoring would be conducted to evaluate the condition of the reconstructed landfill cover, the sedimentation basin and wetlands water quality, and groundwater quality. The reconstructed cover would be monitored periodically for differential settlement. The frequency of all sampling activities and inspections will be determined by the Agencies during Remedial Design.

The landfill cover would be reconstructed by removing existingtrees and brush on the landfill, sealing leachate seeps, regrading the site, locating a suitable borrow site for fill material, importing fill material as necessary, placing this fill on top of the existing surface soils, and vegetating the new cover. A minimum cover thickness of 2 ft. would be established over the entire landfill. In areas where sewage sludge has been deposited on the landfill, a minimum of 6 in. of new soil will be placed, regardless of the depth of existing cover soils. The reconstructed cover would also be sloped by filling and regrading to promote surface water drainage from the landfill area. The reconstructed cover would extend to the edge of the landfill and would avoid the adjacent wetlands. The trees and brush removed from the landfill would be appropriately disposed of, as approved by the Agencies. Erosion control measures would be taken to protect the perimeter wetlands. A surface water control system would also be part of this remedy.

Capital cost: $4,418,000
Annual maintenance and monitoring cost: $69,000
Estimated present net worth: $5,770,000
Estimated time to implement: 6 months

ALTERNATIVE 5 - INSTITUTIONAL CONTROLS, RECONSTRUCT EXISTING COVER, GROUNDWATER EXTRACTION SYSTEM, AND MONITORING

The major elements of Alternative 5 are the same as Alternative 4 with remediation of contaminated groundwater included. These elements would therefore include:

- Institutional controls
- Monitoring
- Cover reconstruction
- Groundwater extraction, treatment, and discharge

The first three elements of this alternative were discussed in Alternative 4. The fourth element, the groundwater extraction system, would consist of installing groundwater extraction wells in the area of vinyl chloride contamination. Groundwater would then be pumped from the extraction system to an on-site treatment facility if the POTW pretreatment standards were exceeded during this action.

Capital cost: $4,860,000
Annual maintenance and monitoring cost: $129,000
Estimated present net worth: $6,490,000
Estimated time to implement: 6 months

ALTERNATIVE 6 - INSTITUTIONAL CONTROLS, CONSTRUCT GEOSYNTHETIC CLAY CAP, AND MONITORING

The purpose of Alternative 6 is to minimize infiltration, promote surface water runoff, eliminate leachate seeps, and isolate the contaminants of concern. The major elements of this alternative include:

- Institutional controls
- Monitoring
- Geosynthetic clay cap

Institutional controls would include land use restrictions and deed restrictions to preclude groundwater usage.

The primary objectives of monitoring would be to monitor sedimentation basin and wetlands water quality, groundwater quality, and the condition of the landfill cap. Periodic groundwater sampling and analysis would be performed. Regular visual inspections would be conducted to evaluate the integrity of the landfill cap, and to check for erosion and differential settlement.

The landfill cap would be constructed as specified in 35 IAC 811.314. Generally, this includes removing the existing trees and brush, regrading the surface, sealing the leachate seeps, placement of a geosynthetic liner with a bentonite component, placement of a drainage layer, a rooting zone layer, and topsoil. The cap would then be revegetated. The geosynthetic clay layer would have a permeability comparable to 3 ft. of compacted clay (1 x 10[7] cm/s). The geosynthetic clay cap would extend to the edge of the landfill and would avoid the adjacent wetlands. The trees and brush removed from the landfill would be appropriately disposed of, as approved by the Agencies. The drainage layer will be designed so as to route landfill gases to a venting system. Erosion control measures would be taken to protect the perimeter wetlands. A surface water control system will be designed appropriate to the final grade such that it will limit erosion of the landfill cover from sheet flow, will not cause degradation of adjacent wetlands, meet local stormwater retention requirements, and allow for the monitoring of surface water runoff at distinct discharge points.

Capital cost: $6,612,000
Annual maintenance and monitoring cost: $69,000
Estimated present net worth: $7,964,000
Estimated time to implement: 6 months

ALTERNATIVE 7 - INSTITUTIONAL CONTROLS, CONSTRUCT GEOSYNTHETIC CLAY CAP, GROUNDWATER EXTRACTION SYSTEM, AND MONITORING

The major element of Alternative 7 are the same as those in Alternative 6 with remediation of contaminated groundwater included. These elements would therefore include:

- Institutional controls
- Monitoring

- Geosynthetic clay cap

- Groundwater extraction, treatment, and discharge

The first three elements of this alternative were discussed in Alternative 6. The fourth element, the groundwater extraction system, would consist of installing groundwater extraction wells in the area of vinyl chloride contamination. Groundwater would then be pumped from the extraction system to the POTW. On-site treatment will be required only if pretreatment standards are exceeded during this action.

Capital cost: $7,054,000
Annual maintenance and monitoring cost: $129,000
Estimated present net worth: $8,681,000
Estimated time to implement: 6 months

ALTERNATIVE 8 - INSTITUTIONAL CONTROLS, CONSTRUCT RCRA SUBTITLE D (i.e., SOLID WASTE-TYPE) CAP, AND MONITORING

The purpose of Alternative 8 is to minimize infiltration, promote surface water runoff, eliminate leachate seeps, and isolate the contaminants of concern. The major elements of this remedy include:

- Institutional controls

- Monitoring

- Solid waste-type cap

Institutional controls would include land use restrictions and deed restrictions to preclude groundwater usage.

The primary objectives of monitoring would be to monitor sedimentation basin and wetlands water quality, groundwater quality, and the condition of the landfill cap. Periodic groundwater sampling and analysis would be performed. Regular visual inspections would be conducted to evaluate the integrity of the landfill cap, and check for erosion and differential settlement.

Cap construction would involve the construction of a RCRA Subtitle D solid waste-type cap which would seal the leachate seeps, limit infiltration, and promote surface water drainage from the landfill area. Construction would begin with removal of the trees and brush on the landfill. The trees and brush removed would be appropriately disposed of, as approved by the Agencies. A borrow site would be located for fill materials, of which a clay source will be of primary importance. Fill material would be imported to provide grades suitable for positive drainage. The constructed cap would generally consist of a low permeability clay layer placed to a compacted thickness of 3ft. A 2.5 ft. protective soil cover may be placed above the clay. A 6 in. organic topsoil layer may then be placed and vegetated.

Capital cost: $9,204,000
Annual maintenance and monitoring cost: $69,000
Estimated present net worth: $9,854,000
Estimated time to implement: 9 months

ALTERNATIVE 9 - INSTITUTIONAL CONTROLS, CONSTRUCT RCRA SUBTITLE D (i.e., SOLID WASTE-TYPE) CAP, GROUNDWATER EXTRACTION SYSTEM, AND MONITORING

The major elements of Alternative 9 are the same as Alternative 8 with remediation of contaminated groundwater included. These elements would therefore include:

- Institutional controls

- Monitoring

- Solid waste-type cap

- Groundwater extraction, treatment, and discharge

The first three elements of this alternative were discussed in Alternative 8. The fourth element, the groundwater extraction system, would consist of installing groundwater extraction wells in the area of vinyl chloride contamination. Groundwater would then be pumped from the extraction system to the POTW. On-site treatment will be required only if pretreatment standards are exceeded during this action.

Capital cost: $9,646,000
Annual maintenance and monitoring cost: $129,000
Estimated present net worth: $11,273,000
Estimated time to implement: 9 months

ALTERNATIVE 10 - INSTITUTIONAL CONTROLS, CONSTRUCT RCRA SUBTITLE C (i.e., HAZARDOUS WASTE-TYPE) CAP, AND MONITORING

The purpose of Alternative 10 is to minimize infiltration, promote surface water runoff, eliminate leachate seeps and isolate the contaminants of concern. The major elements of this remedy include:

- Institutional controls
- Monitoring
- Hazardous waste-type cap

Institutional controls would include land use restrictions and deed restrictions to preclude groundwater usage.

The primary objectives of monitoring would be to monitor sedimentation basin and wetlands water quality, groundwater quality, and the condition of the landfill cap. Groundwater sampling and analysis would be done on a periodic basis. Periodic visual inspection of the landfill cap and monitoring for differential settlement would also be performed.

Cap construction would involve the construction of a RCRA Subtitle C hazardous waste-type cap which would seal the leachate seeps, limit infiltration, and promote surface water drainage from the landfill area. Construction of the landfill cap would begin with removal of the trees and brush on the landfill. The trees and brush removed would be appropriately disposed of, as approved by the Agencies. A borrow site would be located for fill materials, of which a clay source will be of primary importance. Fill material would be imported to provide grades suitable for positive drainage. The RCRA Subtitle C cap would generally include the following components: a 2 ft. thick compacted clay layer, a 40 ml. high density polyethylene flexible membrane liner, a 1 ft. thick drainage layer, an 18 in. rooting zone, a 6 in. topsoil layer, and a vegetative cover.

Capital cost: $12,244,000
Annual maintenance and monitoring cost: $69,000
Estimated net worth: $13,596,000
Estimated time to implement: 1 year

ALTERNATIVE 11 - INSTITUTIONAL CONTROLS, CONSTRUCT RCRA SUBTITLE C (i.e., HAZARDOUS WASTE-TYPE) CAP, GROUNDWATER EXTRACTION SYSTEM, AND MONITORING

The major elements of Alternative 11 are the same as Alternative 10 with remediation of contaminated groundwater included. These elements would therefore include:

- Institutional controls
- Monitoring
- Hazardous waste-type cap
- Groundwater extraction, treatment and discharge

The first three elements of this alternative were discussed in Alternative 10. The fourth element, the groundwater extraction system, would consist of installing groundwater extraction wells in the area of vinyl chloride contamination. Groundwater would then be pumped from the extraction system to the POTW. On-site treatment would be required only if pretreatment standards were exceeded during this action.

Capital cost: $12,686,000
Annual maintenance and monitoring cost: $129,000
Estimated present net worth: $14,313,000
Estimated time to implement: 1 year

VIII. Evaluation of Alternatives

The NCP requires that the alternatives be evaluated against nine evaluation criteria. This section summarizes the relative performance of the alternatives by highlighting the key differences among the alternatives in relation to these criteria. The nine evaluation criteria are categorized as: (1) Threshold Criteria; (2) Primary Balancing Criteria; and (3) Modifying Criteria. Each of these terms is described as follows:

- **!** Threshold Criteria
  - 1) Overall protection of human health and the environment addresses whether a remedy provides adequate protection of human health and the environment and describes how risks posed through each exposure pathway are eliminated, reduced orcontrolled through treatment and engineering controls. The selected remedy must meet this criteria.
  - 2) Compliance with applicable or relevant and appropriate requirements (ARARs) addresses whether a remedy will meet federal and state environmental laws or justifies a waiver from such requirements. The selected remedy must meet this criteria or waiver of the ARAR must be obtained.
- **!** Primary Balancing Criteria
  - 3) Long-term effectiveness and permanence refers to expected residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time, once cleanup goals have been met.
  - 4) Reduction of toxicity, mobility, and volume through treatment is the anticipated performance of the treatment technologies a remedy may employ.
  - 5) Short-term effectiveness addresses the period of time needed to achieve protection and any adverse impacts on human health and the environment that may be posed, until cleanup goals are achieved.
  - 6) Implementability is the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement a particular option.
  - 7) Cost includes estimated capital and operation and maintenance (O&M) costs, also expressed as net present-worth cost.
- **!** Modifying Criteria
  - 8) Support Agency (IEPA) acceptance reflectsaspects of the preferred alternative and other alternatives the IEPA favor or object to, and any specific comments regarding federal and state ARARs or the proposed use of waivers.
  - 9) Community acceptance summarizes the public's general response to the alternatives described in the proposed plan and in the RI/FS, based on public comments received.

A detailed discussion of all the alternatives, including the "No Action" alternative, has been provided in the FS. This evaluation also includes an evaluation against the nine criteria. The NCP requires that the "No Action" alternative be evaluated to establish a baseline against which all other alternatives are measured. A summary of the evaluation discussion is provided below.

Overall Protection of Human Health and the Environment

Based upon the detailed analysis, it was concluded that Alternatives 1 through 5 would not satisfy the criterion of ensuring the overall protection of human health and the environment. The baseline risk assessment has documented unacceptable risks present at the site and these alternatives do not meet the

criterion either because no remedial action would be taken (Alternative 1) or the remedial actions specified would not adequately address the present and future risks posed by the site, or adequately prevent further leachate generation and releases of contaminants to the environment.

The remaining Alternatives, 6 through 11, would be protective of human health and the environment in regards to exposure to surface soils. The differences in cap design among these alternatives is a function of their complexity and would not result in increased protectiveness from surface soil exposure. However, the increased cap complexity would affect leachate generation with the cap specified in Alternatives 10 and 11 yielding the least amount of leachategeneration. The surface water seeps which are a result of leachate generation are expected to be eliminated through placement of a cap on the landfill. The caps for Alternatives 6 through 9 would permit slightly greater infiltration rates than the caps for Alternatives 10 and 11. This would result in slightly greater leachate generation than that provided by Alternatives 10 and 11.

The caps proposed may have the undesirable effect of trapping gas inside the landfill, resulting in a potential increase in lateral migration of landfill gas. This will be remedied through placement of a venting system in the landfill.

Alternatives 6, 8, and 10 would not be protective of human health and the environment with respect to groundwater in that no remedial activities are proposed in these alternatives to address this potential or actual risk to human health and the environment.

Compliance With ARARs

Only Alternative 7 would comply with all chemical, action, and location specific ARARs associated with the site. More specifically, Alternatives 1 through 5 would not comply with the action-specific or chemical-specific ARARs which require landfill capping (IAC 811) and remediation of the contaminated groundwater (40 CFR 141 and 35 IAC 620.410). Alternatives 6, 8, and 10 would not comply with chemical-specific ARARs since these alternatives do not require remediation of the contaminated groundwater. Alternatives 9 and 11 would not meet the location-specific ARAR (40CFR 6) since these alternatives would result in the loss of wetlands due to cap placement and other remedial alternatives exist which would not require mitigating the loss of these wetlands. If an alternative were chosen that results in a loss of wetlands, mitigating the loss of those wetlands generally requires replacement on a 2 to 1 ratio. A listing of all ARARs associated with each alternative can be found in Table11 of the FS.

Long-term Effectiveness and Permanence

Capping the landfill would contain the surface soils, sediments, sludges and wastes effectively. A cap would permanently reduce infiltration into the landfill therefore reducing leachate generation to the maximum extent practicable. Alternatives 10 and 11 would provide the most effective infiltration reduction option of all the alternatives. However, since the waste mass is in contact with groundwater, the more effective infiltration reduction achieved by Alternatives 10 and 11 is not considered to be significant in comparison to either of the caps specified in Alternatives 6 and 7 or 8 and 9. All the capping alternatives (4 through 11) would eliminate human exposure to the contaminated surface soils and would also minimize the ecological risks posed by this media with Alternatives 10 and 11 being most protective due to the thickness of the cap.

The alternatives addressing groundwater extraction (3, 5, 7, 9, and 11) would be effective in preventing further migration of the vinyl chloride and would ultimately eliminate the threat posed by this media through extraction and treatment.

Reduction of Toxicity, Mobility or Volume

None of the alternatives would reduce toxicity or volume of the insitu landfill wastes. Alternatives 1 through 3 would only require monitoring and institutional controls. Alternatives 4 through 11 are containment alternatives and would also not reduce the toxicity and volume of in-situ wastes. However, the capping alternatives would reduce the volume of leachate being produced by minimizing infiltration. This would also reduce the mobility of the contaminants. Alternatives 5, 7, 9, and 11 would reduce the toxicity, mobility and volume of contaminants in the groundwater through an active groundwater extraction system.

Short-term Effectiveness

Alternatives 5, 7, 9, and 11 would result in compliance with groundwater standards through extraction of the contaminated groundwater and treatment at the POTW. A higher level of risk is associated with these

alternatives due to the potential dewatering of the wetlands. Design of the system must preclude this from occurring. In addition, erosion controls, drainage swales, and sedimentation basins are necessary to protect the wetlands during construction as well as after construction is complete. Remediation activities would also result in increased risk of injury due to increased truck traffic on other related construction activities. The increase in dust generation must also be minimized through dust control measures or the use of personal protective equipment by workers. It is expected that the duration of capping activities specified in Alternatives 4 through 11 will not exceed one year. Remediation of the contaminated groundwater as called for in Alternatives 3, 5, 7, 9, and 11 is not expected to exceed five years.

Implementability

All the alternatives are readily implementable. The capping alternatives and those alternatives specifying groundwater extraction have been proven to be an effective technology in remediating similar threats on other sites. Technologies for constructing a groundwater extraction system are relatively easy to implement, well developed, and are reliable. If treatment is required before discharge, the technologies for treatment are proven and readily implementable.

Cost

The costs for the eleven identified alternatives range from $37,000 (Alternative 1) up to $14,313,000 (Alternative 11) in terms of present net worth. The capital costs range from $0 (Alternative 1) up to $12,686,000(Alternative 11). The following summary table lists each alternative and the associated costs:

State Acceptance

The State of Illinois, through IEPA, is expected to concur with the U.S. EPA's recommendation of Alternative 7 as the preferred alternative for the Woodstock site.

Community Acceptance

A summary of both written and verbal comments received by the U.S. EPA during the public comment period has been attached as Appendix II. Generally, the remedy was highly controversial due to the potential local tax implications associated with implementing the remedy. As is reflected in the attached summary, there was one faction of residents who strongly supported the proposed remedy and another faction in opposition.

IX. Description of Selected Remedy

The U.S. EPA and IEPA have conducted an analysis of the potential remedies and have selected Alternative 7 as the remedy for the Woodstock site.

The purpose of Alternative 7 is to minimize infiltration, promote surface water runoff, eliminate leachate seeps, isolate the waste, and remediate the contaminated groundwater. The major elements of this alternative include:

- Institutional controls
- Monitoring
- Geosynthetic clay cover
- Groundwater extraction, treatment, and discharge

Institutional controls will include land use restrictions to prevent future development of the site and adjoining property and to precludeconstruction of any structure which may be detrimental to the remedy. Deed restrictions are already in place at the site which preclude groundwater usage and would be amended and expanded, as necessary, to the satisfaction of the Agencies to prohibit the installation of water supply wells on property which could potentially be impacted by vinyl chloride contamination.

The primary objectives of monitoring will be to monitor sedimentation basin and wetlands water quality, groundwater quality, and the condition of the landfill cover. Periodic groundwater sampling and analysis will be performed. Regular visual inspections will be conducted to evaluate the integrity of the landfill cover, and check for erosion and differential settlement. Long term maintenance will be conducted to assure that the components of this remedy remain effective. The frequency of all sampling activities and inspections

will be determined by the Agencies during Remedial Design.

The landfill cap would be constructed as specified in 35 IAC 811.314. Generally, this includes removing the existing trees and brush on the landfill, placement of the contaminated soils and sediments on the landfill surface, regrading the surface using existing on-site soils and at least 6 inches of supplemental granular soils to achieve and maintain positive drainage, sealing the leachate seeps, placement of a geosynthetic membrane which will include a bentonite layer, placement of a drainage layer, a rooting zone layer, and topsoil. The cap would then be revegetated. During the design of the remedy, the potential use of native vegetation will be investigated in conjunction with the Soil Conservation Service. The final cap design and vegetative cover will then be selected at the completion of this process. The barrier layer will have a permeability equal or superior to 3 feet of compacted clay at 1x10[-7] cm/s. The geosynthetic clay cap will extend to the edge of the landfill and will avoid the adjacent wetlands. Trees and brush removed from the landfillwould be appropriately disposed of. The grading layer will be designed so as to route landfill gases to a venting system. Perimeter side slopes are to be regraded to allow for no impact to the wetlands and accommodate the design requirements of the landfill cap. Erosion control measures would be taken to protect the perimeter wetlands. A surface water control system will be designed appropriate to the final grade such that it will limit erosion of the landfill cover from sheet flow, will not cause degradation of adjacent wetlands, meet local stormwater retention requirements, and allow for the monitoring of surface water runoff at distinct discharge points. The precise design of the cap components and associated engineering or environmental requirements will be reviewed and approved by the Agencies during Remedial Design.

The groundwater extraction system will consist of installing groundwater extraction wells in the area of vinyl chloride contamination. Groundwater would be pumped from the extraction system to an on-site treatment facility if the POTW pretreatment standards were exceeded. The goal of this remedial action is to restore ground water to its beneficial use, which is, at this site, a drinking water resource. Therefore, remediation will continue until such time that the MCL (and equivalent state standard) of 2 ppb is attained. Based on information obtained during the remedial investigation and on a careful analysis of all remedial alternatives, U.S. EPA and IEPA believe that the selected remedy will achieve this goal. However, it may become apparent, during design, implementation or operation of the ground water extraction system and its modifications, that contaminant levels have ceased to decline and are remaining constant at levels higher than the remediation goal over some portion of the plume or that a more effective technology may be warranted. In such a case, the system performance standards and/or the remedy may be evaluated and changes to the system or a different technology may be required which wouldallow the Agencies to achieve ARARs.

The selected remedy will include ground water extraction during which the system's performance will be carefully monitored on a regular basis, as determined by the Agencies, and adjusted as warranted by the performance data collected during operation. Modifications may include any or all of the following:

- Discontinuing pumping at individual wells where cleanup goals have been attained;
- Alternating pumping at wells to eliminate stagnation points;
- Pulse pumping to allow aquifer equilibration and to allow adsorbed contaminants to partition into ground water;
- Installing additional extraction wells to facilitate or accelerate cleanup of the contaminant plume.

To ensure that cleanup levels are maintained and that the cap prevents all further releases from occurring, the site will be monitored on a frequency as required by the Agencies. If further releases do occur, the Agencies may require that further remedial actions are undertaken to eliminate these releases.

The sediments that contain levels of contamination that exceed background levels will be excavated and placed under the new landfill cover. The wetlands areas from which these sediments are removed must then be restored to their original conditions. Excavation and consolidation of these sediments under the cap will reduce the exposure potential to humans or wildlife to this contaminated media.

X. Statutory Determinations

The selected remedy must satisfy the requirements of Section 121 of CERCLA to:

A. Protect human health and the environment;
B. Comply with ARARs;

C. Be cost-effective;
D. Utilize permanent solutions and alternate treatment technologies to the maximum extent practicable; and
E. Satisfy the preference for treatment as a principle element of the remedy.

The implementation of the selected remedy at the Woodstock site satisfies the requirements of CERCLA as detailed below:

A. Protection of Human Health and the Environment

Implementation of the selected remedy will reduce and control potential risks to human health posed by exposure to contaminated ground water, soil, landfill waste, surface water, and sediments. The selected remedy will reduce potential exposure to contaminated groundwater and surface soils to within acceptable an acceptable risk range. The contaminated groundwater will be remediated until the MCL of 2 ppb is reached. The selected remedy also protects the environment from the potential risks posed by contaminants discharging to ground water, Kishwaukee River, surrounding soils, sediments, and wetlands.

Institutional controls will be implemented to protect against drinking of contaminated ground water at the site and prohibit construction which could be detrimental to the remedy.

Capping the landfill, in addition to reducing the potential risk posed by exposure to landfill contaminants, will reduce precipitation infiltration through the cap thereby reducing leachate generation. Ground water contaminant loading, leachate generation, and seepage into the wetlands would then be reduced or eliminated.

Gas venting will reduce potential risks due to the landfill gases.

Excavation and consolidation of contaminated sediments under the landfill cap will reduce the exposure potential to humans or wildlife posed by these sediments. No unacceptable short-term risks will be caused by implementation of the remedy. However, the nearby community, and site workers, may be exposed to noise and dust nuisances during construction. Standard safety measures should manage any short-term risks. Dust control measures would mitigate risks as well. Mitigative measures, as specified during design, will be taken to prevent and address adverse environmental impacts.

B. Compliance with ARARs

With respect to any hazardous substances, pollutants or contaminants that will remain on-site, CERCLA (S 121 (2) (A)) requires the U.S. EPA to select a remedial action which complies with legally applicable or relevant and appropriate standards, requirements, criteria or limitations (ARARs). The selected remedy will comply with Federal ARARs or State ARARs where State ARARs are more stringent, as determined by U.S. EPA. The remedy will be implemented in compliance with applicable provisions of CERCLA and the NCP.

1. Chemical-Specific ARARs

Chemical-specific ARARs regulate the release to the environment of specific substances having certain chemical characteristics. Chemicalspecific ARARs typically define the extent of cleanup at a site.

a. Soils/Sediments

There are no chemical-specific standards established for soils and sediments.

b. Ground Water

i). Federal ARARs

Maximum Contaminant Levels (MCLs), Maximum Contaminant Level Goals (MCLGs), and Secondary Maximum Contaminant Levels (SMCLs) are ARARs for the site.

ii). State ARARs

The State of Illinois is authorized to administer the implementation of the Federal SDWA. The State also has ground water quality standards promulgated under Title 35, Subtitle F, Chapter I, Part 620. According to the State of Illinois' classification system, the aquifer underlying the site is Class I potable resource groundwater. Class I groundwater quality standards listed under 620.410 are ARARs for the ground water at

the Woodstock site.

In the event that discharge of the contaminated groundwater to the POTW is not acceptable without on-site treatment, IAC 35, Part 218 would then be an ARAR for the site.

c. Surface Water

i). Federal ARARs

Federal water quality criteria (WQC) are guidelines that set pollutant concentration limits to protect surface waters that are applicable to point source discharges, such as from industrial or municipal wastewater streams. At a Superfund site, the Federal WQC would not be ARARs except for pretreatment requirements for discharge of treated water to a Publicly Operated Treatment Works (POTW). Since the selected remedy plans to discharge to the local POTW, these requirements are ARARs for the Woodstock site. The AWQCs for protection of freshwater aquatic organisms are ARARs for the Woodstock site remedy for any direct discharges to the Kishwaukee River.

ii). State ARARs

The State of Illinois has been authorized to implement the National Pollutant Discharge Elimination System (NPDES) established under the CWA, as specified in IAC 35, Part 309. For any discharge to waters of the State of Illinois, the chemical specific standards of Title 35, Subtitle C, Subpart B, Section 302.208 and toxic substances standards of Section 302.210 of the Illinois Administrative Code establishing General Use Water Quality Standards would be ARARs.

2. Location Specific ARARs
Location-specific ARARs are those requirements that relate to the geographical position of a site. These include:

a. Federal ARARs

40 CFR 6 - Protection of Wetlands is an ARAR for any remedial action taken within wetlands. This ARAR requires that activities required in a wetland must minimize the destruction, loss, or degradation of the wetland. In addition, any affected wetlands may be restored, as appropriate. In addition, a permit from the U.S. Army Corps of Engineers may be required due to the potential that activities during construction may impact the wetlands.

Endangered Species Act (16 USC 1531) - The Endangered Species Act requires that actions must be performed to conserve the endangered or threatened species located in and around the Woodstock site. Activities must not destroy or adversely modify the critical habitat upon which endangered species depend. The selected remedy will be implemented in compliance with this regulation.

b. State ARARs

Endangered Species Protection Act, Title 17 Conservative Chapter 1, Subchapter C, Part 1075 Illinois Administrative Rules - Under this requirement, actions must be performed to conserve the endangered or threatened species located in and around the Woodstock site. Activities must not destroy or adversely modify the critical habitat upon which endangered species depend. The selected remedy will be implemented in compliance with this regulation. Prior to conducting remedial activities, a survey of the subject areas will be conducted to determine whether or not endangered or threatened species will be affected.

3. Action-Specific ARARs

Action-specific ARARs are requirements that define acceptable treatment and disposal procedures for hazardous substances.

It is unknown at this time whether or not the collected ground water will require treatment prior to discharge to the POTW. If required, any treatment system utilized will be operated in compliance with all ARARs including 40 CFR 403.

40 CFR 122 is an ARAR at this site in regards to surface water runoff which includes stormwater runoff.

29 CFR 1910 and 1926 are OSHA requirements which are ARARs at the site.

a. State ARARs

The selected remedy will comply with substantive requirements of Title 35, Illinois Solid and Special Waste Management Regulations, Section 811, Subpart C for closure of solid wastes landfills, specifically relating to final cover, air pollution, and closure requirements, as required.

Groundwater that is treated and discharged shall comply with 35 IAC, Part 307 as well as 35 IAC, Part 310 which are ARARs for this site since pretreatment standards, permitting, and reporting requirements must be met for POTW discharge.

35 IAC, Part 620.250 which provides for the establishment of a groundwater management zone is an ARAR for the site.

C. Cost Effectiveness

Cost effectiveness is determined by evaluating the following three of the five balancing criteria to determine overall effectiveness: long-term effectiveness and permanence, reduction of toxicity, mobility or volume through treatment, and short-term effectiveness. Overall effectiveness is then compared to cost to ensure that the remedy is cost effective.

The selected remedy provides overall cost effectiveness because it provides adequate long-term effectiveness and permanence. Secondary reduction in toxicity, mobility, and volume is accomplished through treatment ofthe ground water. No unacceptable short-term risks will be caused by implementation of the remedy.

D. Utilization of Permanent Solutions and Alternative Treatment Technologies or Resource Recovery Technologies to the Maximum Extent Practicable

The selected remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable. This finding was made after evaluation of the protective and ARAR-compliant alternatives for the Woodstock site remedial action and comparison of the "trade-offs" (advantage vs. disadvantages) among the remedial alternatives with respect to the five balancing criteria (see discussion above).

E. Preference for Treatment as a Principle Element

The principle threats at the Woodstock site are the contaminated ground water and contaminated soil and leachate. The selected remedy uses treatment as a secondary element of the remedy through the collection and treatment of contaminated groundwater. Due to the large volume and heterogeneous distribution of waste throughout the landfill, treatment of the landfill material itself is not practicable at this site.

APPENDIX III
DATA TABLES
MONITORING WELLS
DISQUALIFIED MONITORING WELL SAMPLES
NOTE FOR APPENDIX F-3a

A sampling error was made at four deep monitoring wells in the Phase I, Round 1 sampling (October 31 to November 2, 1991). The analytical results which were disqualified as a result of the sampling error are presented in this Appendix.

The initial analytical results (from October 31 to November 2, 1991 sampling) indicated that trichloroethylene (TCE) and Xylenes had been detected at or below detection limit in monitoring wells MW-1D, MW-2D, MW- 5D, and MW-6D; total xylenes were also estimated at 2 ug/l at each of these wells. During data validation, it was discovered that trace levels of TCE were also found in the field blanks collected through the bladder pump which had been used to purge and sample these wells. The blanks indicated TCE levels of 18 ug/l and a xylene level of 2 ug/l. It was discovered that the pump used to purge these wells had previously been used at a site contaminated with TCE. These monitoring wells were re-sampled on December 12, 1990. The results of the resampling indicated no detection of either trichloroethylene or xylenes.

PRIVATE WELLS

ANALYTICAL DATA REPORT
Woodstock Landfill RI/FS
Woodstock, Illinois

Matrix: PW Type: MTL

Parameter	WK-PWFB01-01 07/24/90	
Aluminum (UG/L)	50.	U/
Antimony (UG/L)	5.	U/
Arsenic (UG/L)	2.	U/
Barium (UG/L)	10.	U/
Beryllium (UG/L)	5.	U/
Cadmium (UG/L)	0.2	U/
Calcium (UG/L)	1000.	U/
Chromium, total (UG/L)	0.51	K/U
Cobalt (UG/L)	10.	U/
Copper (UG/L)	10.	U/
Iron (UG/L)	20.	U/
Lead (UG/L)	3.	U/
Magnesium (UG/L)	1000.	U/
Manganese (UG/L)	10.	U/
Mercury (UG/L)	0.2	U/
Nickel (UG/L)	20.	U/
Potassium (UG/L)	100.	UN/UJ
Selenium (UG/L)	2.	U/
Silver (UG/L)	0.5	U/UJ
Sodium (UG/L)	1000.	U/
Thallium (UG/L)	3.	U/
Vanadium (UG/L)	50.	U/
Zinc (UG/L)	10.	U/
Cyanide (UG/L)	10.	U/

Note: (1) Results are reported with qualifiers (Laboratory Qualifier/Data Validation Qualifier) to the right of the value.

SEDIMENT

LANDFILL GAS

LEACHATE WELLS

LABORATORY RESULTS
VOLATILE ORGANIC REPORT

Project: Woodstock Landfill Project #:
60776.34

Location: Woodstock, Illinois Date Sampled:
7/19/91

Compound	Method Detection Limits (ug/L)	3006-001 SB1	3006-002 SB2	3006-003 SB1	3006004 SB3	3006-005 SB5
Benzene	1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Ethylbenzene	1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Toluene	1.00	<1.00	<1.00	<1.00	<1.00	<1.00
m- and p-Xylene	2.00	<2.00	<2.00	<2.00	<2.00	<2.00
o-Xylene	1.00	<1.00	<1.00	<1.00	<1.00	<1.00

Method Reference: EPA-600, "Methods for Organic Chemical Analysis of Municipal and Industrial Wastewaters", July 1982, Method 602.

AQUIFER MATRIX

SURFACE SOIL

TEST PITS

SURFACE WATER